

EXHIBIT 11
[UNREDACTED in the PUBLIC RECORD]

1 UNITED STATES DISTRICT COURT
2 NORTHERN DISTRICT OF CALIFORNIA
3 SAN FRANCISCO DIVISION
4

5 IN RE SEAGATE TECHNOLOGY, LLC
6 LITIGATION,

_____ No. 3:16-cv-00523 JCS

7 CONSOLIDATED ACTION
8
9 _____

10 HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY
11

12 Videotape Deposition of Andrew Hospodor,
13 Ph.D., taken at Four Embarcadero Center, 17th
14 Floor, San Francisco, California, on Friday,
15 December 15, 2017 at 9:48 a.m.
16
17
18
19
20
21

22 REPORTED BY:

23 Mary Hogan CSR No. 05386
24
25

1 MS. SCARLETT: Objection to form.

2 Q (By Ms. Rodewald) Do you know the
3 serial number of the drive?

4 MS. SCARLETT: Objection, form.

5 THE WITNESS: Not off the top my head.
6 I haven't memorized it.

7 Q (By Ms. Rodewald) In this action, in
8 your report, your declaration, you do not opine
9 that the ST3000DM001 drives had any specific
10 defect, do you?

11 MS. SCARLETT: Objection to form.

12 THE WITNESS: In my report I provide
13 exemplary information of a number of different
14 defects.

15 Q (By Ms. Rodewald) Did you identify any
16 specific defect that you opine is common to the
17 ST3000DM001 drives at issue in this litigation?

18 MS. SCARLETT: Objection to form.

19 THE WITNESS: So my role in this was
20 not to identify a common defect.

21 There certainly are things that appear
22 over and over again as issues in the production of
23 the Seagate ST drives.

24 My role here was to identify whether
25 or not the annualized failure rates, or AFR, was

1 actually within Seagate's claim of being less than
2 1 percent or less than .3 percent as they
3 advertised in their marketing materials.

4 Q (By Ms. Rodewald) What percentage of ST
5 drives sold to consumers failed?

6 MS. SCARLETT: Objection to form.

7 THE WITNESS: I don't know.

8 Q (By Ms. Rodewald) But it is your
9 opinion that they had a higher failure rate than 1
10 percent?

11 A The data that I've reviewed indicates
12 that from the beginning of the production process
13 Seagate knew that this drive had an annualized
14 failure rate of more than .34 and more than
15 1 percent.

16 Q Is it your opinion that the ST drives
17 in consumers' hands failed at a higher rate than 1
18 percent?

19 MS. SCARLETT: Objection to form.

20 THE WITNESS: So I don't -- I can't
21 opine on what is in consumers' hands. I have not
22 seen the data for consumers' hands.

23 Q (By Ms. Rodewald) Is it your opinion
24 that the ST drives for the entire period from 2011
25 to 2016 had the same failure rate?

1 MS. SCARLETT: Objection to form.

2 THE WITNESS: It is my opinion that
3 they did not.

4 Q (By Ms. Rodewald) And what were the
5 differences? Did the failure rate vary over time?

6 MS. SCARLETT: Objection to form.

7 THE WITNESS: During the time and the
8 data that I examined, the failure rate was
9 constantly increasing and it was above 1 percent.

10 Q (By Ms. Rodewald) What do you mean by
11 "constantly increasing"?

12 A Let's go into my expert report and
13 I'll show you. Please, let's do it.

14 Q Hold on. I think this is a very
15 simple question.

16 A I wanted to answer you accurately.

17 Q When you say "constantly increasing,"
18 do you mean that hard drives manufactured in 2014
19 had a higher failure rate than hard drives
20 manufactured in 2011?

21 A I'm going to answer you out of my
22 expert report.

23 So in projecting AFR, Seagate -- I'm
24 on paragraph 90 of my declaration. In projecting
25 the AFR, Seagate utilized a Weibull,

1 W-E-I-B-U-L-L, Beta value that reflected the
2 assumption that the failure rate of the drive
3 would decrease with time, but the failure rate
4 actually increased from an AFR of 2.34 percent to
5 2.61 percent to 3.36 percent within just eight
6 months after the start of mass production.

7 Q Are you saying in this paragraph that
8 hard drives manufactured eight months after the
9 start of production had a higher failure rate than
10 hard drives manufactured at the beginning of the
11 start of production?

12 A That is exactly what this is saying.
13 Okay.

14 Q Okay. Is it your opinion that, by
15 extension, hard drives manufactured a year later
16 had a higher failure rate?

17 MS. SCARLETT: Objection, form.

18 THE WITNESS: I don't have any data.
19 You asked me whether or not over a period the
20 drives had increased or decreased, and I'm showing
21 you that during the period you had asked for the
22 drives had increased.

23 The data that I have is just this
24 data. It's meant to be exemplary, not
25 comprehensive.

1 report and flush them out, but I'm not sure off
2 the top my head if the eight months is referring
3 to the start of mass production for the -- for the
4 SBS drives or the bare drives, so I -- I would
5 have to go back and review my report to see that.

6 Q Okay.

7 A And I'm trying to answer you --

8 Q No.

9 A -- as factually as I can.

10 Q I understand. And we can look at some
11 documents later, you know, later in the
12 deposition.

13 I'm trying to get some general
14 overview now and trying to understand some
15 concepts, and then we'll go back and tie down some
16 of these things.

17 Okay. Do you know what percentage of
18 the named plaintiffs' drives failed?

19 MS. SCARLETT: Objection to form.

20 THE WITNESS: I'm sorry. The named
21 plaintiffs being the parties who brought the suit?

22 Q (By Ms. Rodewald) Correct.

23 A I do not, but I can assume that they
24 wouldn't bring suit unless their drives had
25 failed.

1 Q But you don't know what percentage?

2 MS. SCARLETT: Objection, form.

3 THE WITNESS: I don't know how many
4 drives they had, when they failed, or how many
5 failed.

6 Q (By Ms. Rodewald) Okay. Do you want to
7 go for a little further before we take a break?

8 A No. We can keep going.

9 Q Is it your understanding that in the
10 hard drive industry hard drives are produced for
11 different intended uses?

12 A So I'm -- I'm not really sure I
13 understand what you're asking.

14 Q Well, let me ask you this: Do hard
15 drive manufacturers such as Western Digital or
16 Seagate or -- I forget Hitachi's current name.
17 It's HG --

18 A -- ST.

19 Q HGST. Is it your understanding that
20 they manufacture some hard drives to be used
21 inside desktop computers, they manufacture other
22 hard drives to be used in what are called
23 enterprise or mission critical applications, and
24 other hard drives to be used inside DVRs and
25 TiVos, or to be used inside laptops?

1 A I can take a look though back at the
2 previous page on 56263, and there is a product
3 here at about 15 months in the lefthand side
4 called MANTARAY where it looks like it's going
5 near verticle.

6 You can see the blue dots in the
7 background there are starting to go straight up
8 and that to me would be indicative of something
9 that could be problematic.

10 Q Going back to 56264, if the graph on
11 the right reaches the cumulative return rate and
12 if CRR reaches the cumulative return rate, can you
13 make any -- do you have any thoughts about whether
14 or not the lines in this graph on the right side
15 are consistent or inconsistent with a Beta of less
16 than 1?

17 MS. SCARLETT: Objection to form.

18 THE WITNESS: So looking at the
19 desktop storage, saying that you've got over a
20 period of 12 months, which is one year, you have a
21 cumulative rate here of about 5.8 percent, so this
22 looks like it's accumulating failures at a -- you
23 know, at an increasing rate almost.

24 It's -- it's -- well, it's at a linear
25 rate here, meaning that the failures will continue

1 to accumulate over time.

2 So I would say it's unlikely that you
3 would be able to achieve an AFR of only 1 percent
4 if you have 5.8 percent of the drives being
5 returned from desktop, which would -- I'm taking
6 to mean consumer storage, running a tool like
7 SeaTools. That would -- you know, that would say
8 that --

9 Q (By Ms. Rodewald) Okay. Sorry. Maybe
10 I wasn't clear.

11 I'm not asking about the AFR. I'm
12 asking about the Beta parameter of the Weibull
13 distribution.

14 MS. SCARLETT: Objection. Is there a
15 question?

16 MS. RODEWALD: Yes. So let me restate
17 the question with that clarification in mind.

18 Q (By Ms. Rodewald) Do you have any
19 thoughts about whether or not the lines in this
20 graph on the right-hand side are consistent or
21 inconsistent with a Beta parameter of the Weibull
22 distribution of less than 1?

23 MS. SCARLETT: Objection, form.

24 THE WITNESS: So in looking at these
25 with the cumulative rates here, we would have to

1 take a look at the probability density functions
2 and do some -- do a little bit more work than just
3 looking at this.

4 I would say, though, that the Moose
5 desktop storage is highly suspicious, and the
6 statements down here seem to think that they are
7 looking at increasing the warranty terms from
8 three years -- from two years to three years.

9 That that's going to increase their
10 Beta and make it more difficult to keep the Beta
11 less than 1.

12 However, I'll note that in everything
13 I've reviewed in here the Beta was set originally
14 at .55 and they actually reduced the Beta in some
15 of the early failure analysis testing for the --
16 for the ST3000DM001.

17 Q (By Ms. Rodewald) Let's just take one
18 line here.

19 The Nighthawk here, the gold-colored
20 line there, is that cumulative failure rate
21 line -- do you have any thoughts on whether or not
22 that line would be consistent or inconsistent with
23 a Beta of less than 1?

24 MS. SCARLETT: Objection to form.

25 THE WITNESS: So part of it will

1 depend upon the expected lifetime of the product,
2 and in looking at the Nighthawk, the slope here
3 flattens out to less than 3 percent.

4 And so what you see there is that
5 the -- the cumulative return rate starts to
6 flatten out, and that would be consistent with a
7 Beta that's less than 1, if those were due to
8 failures.

9 Q (By Ms. Rodewald) Okay. And that is
10 because the return rate is getting -- apparently
11 getting smaller over time; is that correct?

12 MS. SCARLETT: Objection to form.

13 THE WITNESS: The cumulative return
14 rate is increasing slowly over time, but the new
15 returns are diminishing.

16 So if that's representative of a
17 reduction in failure over time, that would
18 indicate a Beta of less than 1.

19 Q (By Ms. Rodewald) Okay. And that's
20 because this line is sort of generally curved --
21 curved in a sort of -- a sort of hump, right?

22 It's curving downwards, not curving up
23 from the straight. It's curving down from the
24 straight, correct?

25 MS. SCARLETT: Objection to form.

1 Q (By Ms. Rodewald) So that's showing
2 that generally, if you take the difference between
3 any two points of time, it seems to be getting
4 smaller.

5 MS. SCARLETT: Objection to form.

6 THE WITNESS: So I would represent
7 that curve in the Nighthawk desktop storage as
8 flattening out and approaching a level where it
9 doesn't appear -- I can't tell, really, but, you
10 know, if it was continued with that slope, it
11 would appear to be able to stay below 3 percent,
12 where the Moose, on the other hand, within 12
13 months has gone -- is approaching close to
14 6 percent in a much shorter period of time.

15 That does not look like it's going to
16 be, you know, flattening out at all, and that
17 would -- for me, I would study that and see
18 whether or not data -- that Beta was actually less
19 than 1 or possibly greater than 1.

20 Q (By Ms. Rodewald) Okay. Are you
21 comfortable making conclusions about Beta just
22 based on looking at this graph?

23 MS. SCARLETT: Objection to form.

24 THE WITNESS: So if we're talking
25 about Beta with respect to AFR, we need some more

1 information.

2 Q (By Ms. Rodewald) Okay. So, for
3 example, if we went from the gold line to the red
4 line to the black line, would you be comfortable
5 saying that Beta was increasing for each of those?

6 MS. SCARLETT: Objection, form.

7 THE WITNESS: So, again, we don't know
8 what the actual percentage of failures are there.

9 Q (By Ms. Rodewald) Okay.

10 A Because these involve OEM drives, so
11 Beta is represented and looking at the Weibull
12 function modeling the actual failure rates, we
13 would have to separate out which of these would
14 actually be due to real failures.

15 But to me they're looking like there
16 is a problem with the Nighthawk because it's
17 flattening out, but I would be suspicious of the
18 Moose with the straight line going up, and I would
19 want to examine that and find some more
20 information about it.

21 Q But would you be comfortable saying --
22 going from the gold line to the red line to the
23 black line, would you be comfortable making any
24 conclusions about whether or not Beta is
25 increasing between each of those?

1 MS. SCARLETT: Objection, form.

2 THE WITNESS: I think this is good
3 evidence that suggests it should be studied.

4 I don't think you can draw an
5 exemplary conclusion just by looking at this data,
6 although I will note this is very similar to
7 Andrei Khurshudov's examining the actual failure
8 rates.

9 He had some similar graphs that were
10 presented and showing that over time the Beta was
11 approaching 1, and even suggested that Seagate
12 rethink a Beta value other than what it had been
13 using in the past, which I believe was .55.

14 Q (By Ms. Rodewald) Okay. So you believe
15 that Andrei was looking at actual failure rates in
16 his report?

17 A I believe --

18 MS. SCARLETT: Objection to form.

19 THE WITNESS: I believe he was, but we
20 can take a look at it.

21 Q (By Ms. Rodewald) And do you
22 believe -- if these were failure rates, would you
23 be comfortable drawing a conclusion about Beta,
24 whether Beta was increasing from the gold to the
25 red to the black, just by looking at the data?

1 MS. SCARLETT: Objection to form.

2 Q (By Ms. Rodewald) On just by looking at
3 the graph and assuming this is a failure rate
4 instead of a return rate, would you be comfortable
5 just eyeballing that and saying that it is
6 increasing?

7 MS. SCARLETT: Objection to form.

8 THE WITNESS: When you're saying red,
9 I'm looking here on the lefthand side of --

10 Q (By Ms. Rodewald) I'm talking about
11 going from the Nighthawk to the Galaxy to the
12 Super Hawk, and we can even add in the Brink, so
13 gold, red, black, green.

14 A Yeah. And again, there isn't enough
15 data there to see whether or not those curves are
16 going to be flattening out.

17 Q Okay. But just by eyeballing this,
18 can you make any conclusions about whether or not
19 the Beta parameter is changing in any direction?

20 A So my --

21 MS. SCARLETT: Objection to form.

22 THE WITNESS: My conclusion here would
23 be this warranted some more investigation.

24 Q (By Ms. Rodewald) Can I take that as a
25 no, you're not comfortable making a conclusion

1 about whether or not Beta is increasing between
2 those lines just by eyeballing the graph?

3 MS. SCARLETT: Objection to form.

4 THE WITNESS: No. My -- my conclusion
5 is that I would need to actually study the data
6 and we need to see where these graphs flatten out.

7 I can't just simply eyeball this and
8 tell you whether Beta is approaching 1 or less
9 than 1, right. We need to do a little bit more
10 work.

11 Q (By Ms. Rodewald) And can you make a
12 conclusion, just by looking at this, whether, for
13 example, the Beta of the black line's greater than
14 the Beta of the gold line?

15 MS. SCARLETT: Objection, form.

16 THE WITNESS: So I can't -- I can't
17 see what the black line's doing over time here, so
18 I can't provide you with that opinion.

19 Q (By Ms. Rodewald) Okay. And just
20 looking up to thirty months, without even just
21 stopping at thirty months, can you make any
22 conclusions about whether or not the Beta for the
23 black line is greater than the Beta for the gold
24 line?

25 MS. SCARLETT: Objection, form.

1 phase referred to as pilot exit.

2 Q Okay.

3 A And accordingly, Seagate test drives
4 pre-release, as well as post-release, so it's
5 right there where the drive is released that
6 Seagate will be collecting and analyzing field
7 data to spot trend and determine whether a drive
8 is meeting its anticipated rate of field returns.

9 Q So after this release it's your
10 understanding that the drive is continued -- hard
11 drive companies in general and Seagate included
12 continue to put the drives through ongoing
13 testing; is that correct?

14 A Yes.

15 Q Okay. And is it your understanding
16 that Seagate called that ongoing activity ongoing
17 reliability testing or ORT?

18 MS. SCARLETT: Objection, form.

19 THE WITNESS: I have seen the term ORT
20 and there may be some other testing that they've
21 done as well.

22 Once the drive does go into
23 manufacturing, it would typically use the same
24 components that were qualified on the drive at the
25 time it was being designed and before it was being

1 handed off from the pilot exit and the quality
2 exit.

3 So what was unusual here is that even
4 though the drive was in mass production, some of
5 the major components appeared to still be designed
6 or redesigned or being replaced.

7 So at the time that they were in the
8 ramp and certainly at the time that they were
9 producing a lot of drives they were still
10 qualifying some of the parts.

11 Q (By Ms. Rodewald) Have you ever been
12 involved in the production of a hard drive that
13 was produced in volume of millions?

14 A Yes.

15 Q And when was that?

16 A That was at Quantum.

17 Q Okay.

18 A In the 1980s -- sorry, 1990s as well.

19 Q And those being hard drive --
20 particular models of the hard drives were being
21 produced in millions of numbers a year?

22 A Yes.

23 Q And were those being produced at a
24 number of factories in a number of different
25 countries as well?

1 A No. I believe we had one major
2 manufacturing facility.

3 Q Was it Quantum's practice at the time
4 to qualify multiple sources for components?

5 A Yes. Quantum would qualify multiple
6 sources before the mass production of the drive
7 began.

8 Q Before they started ramping production
9 they would qualify multiple sources?

10 A Yes.

11 Q And is it possible that a company
12 would qualify multiple sources during the ramp
13 phase?

14 MS. SCARLETT: Objection, form.

15 THE WITNESS: It not something that
16 I've ever seen.

17 Q (By Ms. Rodewald) How many drives have
18 you been involved with taking from design through
19 approval for sale through a ramp?

20 A Dozens.

21 Q And was that all at Quantum?

22 A That was primarily at Quantum, and
23 then I had also done consulting work where I
24 assisted other disk drive companies.

25 Q When was that?

1 A In the back of my resume, I think it
2 was '83 to '86. Let's see. It may have been
3 earlier or later.

4 So when I was at I/O Xel, '86 to 1990,
5 and so I worked with companies like Quantum,
6 Prium, Maxtor and Iomega and assisted them in
7 taking their product through this process.

8 Q And you were involved in qualifying
9 component suppliers?

10 A I actually at the time developed
11 something called the SCSI benchmark tester and
12 that was the first patent that I received, and
13 these companies used the tester to evaluate some
14 of the suppliers of some of their components.

15 Q So you're saying that it's not -- it's
16 not standard practice to continue qualifying new
17 suppliers of parts during the ramp phase of
18 production?

19 MS. SCARLETT: Objection, form.

20 THE WITNESS: I'm not familiar with
21 that, and I would think it's somewhat dangerous.

22 Q (By Ms. Rodewald) Why?

23 A Because you're about to start building
24 millions of things with parts that you don't
25 really know very much about.

1 Q That's the purpose of the
2 qualification process, isn't it?

3 MS. SCARLETT: Objection, form.

4 THE WITNESS: That's why I believe the
5 qualification process should occur before the mass
6 production.

7 Q (By Ms. Rodewald) During ongoing
8 reliability testing or whatever you want to call
9 it -- let me see.

10 Have you ever been involved in that
11 process, the process of either doing or
12 supervising, directly supervising, ongoing
13 reliability testing?

14 A Yes.

15 MS. SCARLETT: Objection to form.

16 THE WITNESS: Sorry. Yes.

17 Q (By Ms. Rodewald) When was that?

18 A That was again at Quantum.

19 Q And can you please explain what your
20 role was with regard to ongoing reliability
21 testing?

22 A So at Quantum we were very interested
23 in what the failure rates were, and my group in
24 systems engineering was responsible, as I said,
25 for drives that were targeted for streaming

1 Q Okay. So you're saying that
2 head-related failures -- you are grouping them all
3 together as being common; is that correct?

4 A No, that is not what I'm saying.

5 Q Okay. So why would it matter whether
6 or not something is called a head-related failure?

7 It sounds to me like you're saying
8 just because something is called a head-related
9 failure you cannot make a conclusion one way or
10 another whether it has anything in common with a
11 different head-related failure; is that correct?

12 MS. SCARLETT: Objection, form.

13 THE WITNESS: Okay. So I didn't
14 understand your first question and I definitely
15 don't understand your second question.

16 Q (By Ms. Rodewald) Okay.

17 A So if you could rephrase them for
18 me --

19 Q Just because two things are called
20 head-related failure, can you make a conclusion
21 about whether or not those two failures have
22 anything in common?

23 MS. SCARLETT: Objection, form.

24 THE WITNESS: So you would look for a
25 common reason for those two heads to fail and if

1 they both had the PFPE lubricant piling up on
2 them, then I would say you've got a common root
3 cause for these failures.

4 Q (By Ms. Rodewald) But you have to look
5 for the root cause, correct?

6 A That's always the best way to do
7 failure analysis.

8 Q So just because two things, two
9 failures happen to be head related does not mean
10 they have a common root cause, correct?

11 MS. SCARLETT: Objection, form.

12 THE WITNESS: I think I previously
13 testified that you can have random failures where
14 there is absolutely no correlation between the two
15 different types of failures and you can have
16 different types of failures within heads, but
17 Seagate wasn't there. I mean, sure, they were
18 there. They were the background.

19 What was overshadowing Seagate's
20 failure process were all these other problems from
21 the drive being immature at the time it was
22 introduced in the mass production.

23 Changing the parts, having problems
24 with lubricants, having contamination, they were
25 very, very far away from testing random failure

1 modes because they hadn't eliminated the other
2 failures yet.

3 Q (By Ms. Rodewald) Are you saying that
4 the head-related failures that Seagate saw were
5 all connected to each other somehow?

6 MS. SCARLETT: Objection, form.

7 THE WITNESS: I'm not making blanket
8 statements about every head failure.

9 Q (By Ms. Rodewald) Okay. What
10 percentage of the head-related failures that
11 Seagate saw were somehow connected to each other?

12 MS. SCARLETT: Objection, form.

13 THE WITNESS: We can review that and
14 look through -- in their own documents they say
15 what percentage of the failures related to things
16 like head instability, what percentage were
17 related to contaminants, what percentage were
18 related to each of the problems that they had
19 identified.

20 Q (By Ms. Rodewald) Okay. But let's say
21 if -- are all problems related to head instability
22 related to each other?

23 A I wouldn't --

24 MS. SCARLETT: Objection, form.

25 THE WITNESS: I wouldn't go so far,

1 saying that.

2 Q (By Ms. Rodewald) Okay. So did you do
3 an analysis of how many, what percentage of the
4 head instability issues Seagate encountered were
5 related to each other or to a common cause?

6 MS. SCARLETT: Objection, form.

7 THE WITNESS: So I did not perform
8 such a comprehensive analysis.

9 My role in drafting this declaration
10 was to provide exemplary evidence of what was
11 going wrong and what impact that would have on
12 consumers and whether or not Seagate could
13 actually meet their 1 percent AFR that was going
14 out to -- in their consumer information.

15 Q (By Ms. Rodewald) And you previously
16 said that the actual failure rate of the drives
17 was not the same from 2011 to 2016, correct?

18 MS. SCARLETT: Objection, form.

19 THE WITNESS: No, I didn't say that.
20 What I said was I had looked at the present
21 failure rate of the drive and had data from the
22 period of 2011 to late 2012, possibly early 2013.

23 Q (By Ms. Rodewald) Okay. So have you
24 made any conclusion about the actual failure rates
25 of the drive beyond the beginning of 2013?

1 A I don't believe that I have. I think
2 that we were looking at just the numbers we
3 obtained from Seagate because we don't have these
4 numbers, and I would be happy to provide a
5 conclusion on that when we have that data.

6 Q What you reviewed -- you reviewed the
7 documents Seagate produced; is that correct?

8 MS. SCARLETT: Objection, form.

9 THE WITNESS: I reviewed a lot of
10 Seagate documents. Which are you talking about?

11 Q (By Ms. Rodewald) Why are you saying
12 you don't have the data?

13 MS. SCARLETT: Objection to form.

14 THE WITNESS: Because I did not review
15 any data based on customer failures in the file.
16 Seagate did not produce that in this case.

17 Q (By Ms. Rodewald) So Paragraph 34, you
18 go on to state, "The data used to calculate AFR
19 and MTBF is usually obtained by conducting
20 accelerated life testing equivalents of running a
21 large population of drives 24 hours per day and
22 seven days per week for at least 30 days in
23 special test chambers which subject the drives to
24 extreme conditions, such as temperature and
25 voltage levels above and below the values listed

1 manufacturer and has their brand on it is that if
2 they are manufacturing disk drives and their disk
3 drives are either 2400 power-on hours or 8760
4 power-on hours, that the disk drive that's inside
5 the enclosure that I buy from them will either be
6 2400 power-on hours per year or 8760 power-on
7 hours per year.

8 I have never seen any piece of
9 information that suggests that customers should
10 only use their Seagate branded storage solutions
11 for less than 2400 hours a year, never seen it.
12 This is the first time today.

13 Q (By Ms. Rodewald) And you have no idea
14 how long the average consumer uses an external USB
15 drive, correct?

16 A I don't think that matters.

17 MS. SCARLETT: Objection to form.

18 THE WITNESS: I don't think that
19 matters.

20 MS. RODEWALD: I think we're up to
21 Exhibit 10.

22 (Exhibit 10 marked.)

23 Q (By Ms. Rodewald) This is the Grenada
24 BP ECQ Approved Final from June 5th, 2012,
25 correct?

1 A This is what it says on the cover,
2 from the Grenada Core Team.

3 Q And what is your understanding of this
4 document?

5 A This document is another version of
6 Grenada Block Point, Grenada BP, and on 26753
7 there are a number of the changes that were made,
8 including the Luxor chip, which was a rewrite
9 channel margin.

10 I believe this was pre-amp chip, a
11 new motor controller chip, changes to the printed
12 circuit board, changes to the firmware, and then
13 considering again a second source media supplier
14 for supply flexibility.

15 This is after the Grenada Classic went
16 into production in April 2011, so 18 months later
17 they are looking at qualifying another supplier
18 for one of the most important pieces of the media.

19 Q This is the Grenada BP though,
20 correct?

21 A This is the Grenada Block Point --
22 these are the changes to make it the ECQ listed on
23 Page 26753.

24 So the Block Point changes are what
25 took it from Grenada Block Point to Grenada ECQ,

1 Q (By Ms. Rodewald) Didn't he say that
2 there is a correlation between the amount of
3 workload stress and the product's propensity to
4 show constant failure rate or wear-out?

5 MS. SCARLETT: Objection, form.

6 THE WITNESS: He did say that.

7 Q (By Ms. Rodewald) Okay. So that would
8 mean that the higher workload products are the
9 ones that have -- are correlated with this
10 propensity to show Beta equals greater than 1,
11 correct?

12 MS. SCARLETT: Objection, form.

13 THE WITNESS: I don't think that's
14 what he said.

15 Q (By Ms. Rodewald) Okay. So it's
16 correct that one of your opinions is that the
17 ST3000DM001 drives had a failure rate that
18 increased over time, correct?

19 A During the period that I reported in
20 this report from April of 2011 through
21 October 2011 to April 2012, it was increasing.

22 Q Do you have an opinion about whether
23 it was increasing outside of that window?

24 A I haven't -- I have not accurately
25 studied the data.

1 I did look through the data that you
2 presented me here today and found that the drives
3 did not continue to meet their expectation for the
4 performance goals that were set in terms of AFR.

5 Q So are all of the bases for your
6 opinions that Seagate did not use the right Beta
7 value stated in your report?

8 MS. SCARLETT: Objection, form.

9 THE WITNESS: I think there are lots
10 of opinions that are floating around in my head,
11 some of which are scattered, some of which may or
12 may not make sense.

13 I tried to write a report that was not
14 comprehensive but one that was exemplary and
15 explained the basis for my opinions and provided
16 the evidence that I had for Seagate not reaching
17 their AFR target of 1 percent.

18 Q (By Ms. Rodewald) Do you know of any
19 evidence, sitting here today, that you did not
20 include in your report?

21 MS. SCARLETT: Objection, form.

22 THE WITNESS: In the back of my report
23 here you will see a long list of numbers.

24 I didn't print every single one of
25 these, and I didn't actually cite every single one

1 drives into mass production in Japan.

2 Quantum designed the drives and then
3 would send teams of manufacturing engineers to
4 Japan to implement the production of the drives,
5 do the preproduction builds, bring the
6 preproduction drives back for testing in Milpitas,
7 California, calculate things like AFR, look at
8 what the yield would be, and when the drive was
9 deemed sufficiently mature, it would go into mass
10 production.

11 And one of the levels was -- you know,
12 is the drive going to be able to achieve a
13 first-pass yield at the start of mass production.

14 Q You are not one of the manufacturing
15 engineers, correct?

16 A I was not a manufacturing engineer,
17 but I had more than enough friends in
18 manufacturing engineering, so I got to hear all
19 the relevant stories, and by the time I was done
20 at Quantum, I was in the management ranks, so I
21 regularly got updates about what was going on and
22 what was on the critical path, what types of
23 problems we're seeing, what we're going to do to
24 get the yield up prior to mass production.

25 Q But Quantum was not responsible for

1 getting the yield up, was it?

2 A Quantum was. Quantum acted hand in
3 hand with MKE to identify and correct any issues
4 prior to mass production, so once the drive went
5 into mass production, it was being cranked out by
6 the millions.

7 And this is at a time before the
8 internet, so we didn't have the ability to issue
9 firmware updates twice a year or three times a
10 year like Seagate was doing during the life of the
11 Grenada product.

12 We had to get it right the first time,
13 and we qualified all of our vendors before we went
14 into mass production.

15 We built prototype drives with
16 combinations of each of the vendors' components to
17 make sure that they all worked together.

18 We did our AFR life-cycle testing. We
19 did all of -- I'm sorry, the accelerated
20 life-cycle testing for AFR.

21 We did all these things prior to
22 getting the drive into production, and it was only
23 when both Quantum and MKE were satisfied with the
24 results that the drive was actually released into
25 mass pro.

1 We would never change or try to put a
2 new part on a drive that wasn't already
3 qualified --

4 Q Okay.

5 A -- once it went into mass pro.

6 Q So you never changed -- after the
7 drive went into mass production, you never
8 qualified new suppliers for parts?

9 MS. SCARLETT: Objection, form.

10 THE WITNESS: We didn't -- as far as I
11 know, we used the suppliers that were qualified
12 during the design phase and used their parts to
13 make the product, and we made sure that those
14 parts were interchangeable with other parts from
15 other manufacturers.

16 So we avoided swapping out a part in
17 the middle of production with a new part that
18 hadn't been qualified with all the other parts.

19 A disk drive has a tremendous amount
20 of parts inside of it. It's a complicated device.

21 We did, however, take new suppliers
22 and look at qualifying them into the production to
23 the next production run of a follow-on product.

24 So if we had a bump in aerial density,
25 if we were going to add some new heads, if we were

1 going to do something different or target a
2 different market, we would use that as an
3 opportunity to qualify a new vendor, knowing that
4 the original drive, in the case of something like
5 a classic drive, was already solid and stable.

6 We would take a look at what we could
7 do in the next generation to add different
8 components into that, get some more capacity out
9 of it, get a little more performance, maybe some
10 more reliability.

11 Q (By Ms. Rodewald) And how -- you said
12 the drives were brought back to California for the
13 accelerated reliability testing -- or accelerated
14 life testing, sorry.

15 How was the AFR calculated from the
16 data?

17 MS. SCARLETT: Objection, form.

18 THE WITNESS: So the drives were put
19 into a similar type of a system where you had
20 four-corners testing, where you are looking at
21 elevated voltages, elevated temperatures, reduced
22 voltages, reduced temperatures to cover all four
23 corners of the specification, and they were run
24 24-7.

25 They had diagnostic software running

1 Q Okay. And do you know what techniques
2 they used to fit the Weibull distribution to the
3 failure data?

4 A You know, I don't know off the top of my
5 head, but I can tell you the tools that were
6 pretty popular at Quantum were MATLAB and Excel.

7 Q Okay.

8 A Both of those have Weibull
9 distributions as a function.

10 Q And was yield data used to calculate
11 either the Weibull parameters or the AFR?

12 A I don't think the yield was used to do
13 either of those.

14 The yield was -- coming out of the
15 first pass was whether or not the drives worked as
16 soon as they were built.

17 So that was the -- the yield tells
18 you, hey, is this drive functional when it gets to
19 the end of the manufacturing line.

20 The AFR data applies to the drives
21 that go into ovens and environmental chambers so
22 that we can do the life-cycle testing on them, so
23 generally there are two slightly different
24 concepts.

25 I mean, obviously a drive has to work

1 generating two or more engineering change requests
2 every single day and that's enough to overwhelm an
3 organization.

4 Q (By Ms. Rodewald) So I have a pretty
5 simple question here. I hope we can figure it out
6 together.

7 You don't cite any documents in
8 connection with Figures 19 and 20, and so I'm
9 wondering if you can tell me what the actual
10 documents are that you got the data from.

11 A So the documents are the documents
12 like this FED SEAG0002724, and all of these
13 documents that represent the monthly engineering
14 change request -- they are called the engineering
15 change request logs.

16 Q Okay.

17 A And it's either this document with a
18 lot of tabs or it's this document and the
19 subsequent documents.

20 Q So I'm pretty sure that that document
21 only had one tab, so that would mean that there
22 are a bunch more of those, but you didn't cite the
23 Bates numbers in connection with these two
24 figures.

25 A We can go back and do that if you need

1 that.

2 I'm sorry. That would have been an
3 oversight, and you know, I hope that we included
4 those in the disclosure in the back --

5 Q Okay.

6 A -- of all the Bates numbers, but if we
7 need to, we can pull those out and get them for
8 you individually.

9 Q Yeah. We were just really trying to
10 figure out how you made these pretty pictures.
11 Couldn't figure it out.

12 Now you've mentioned customer code
13 ECRs, and what does that mean?

14 A So a customer code, my understanding
15 is that would be a change that was implemented at
16 the request of a specific customer.

17 Q And what might those be?

18 A It's too loud. It's -- you know, it's
19 got the wrong color sticker on it, it doesn't
20 accept this vendor unique command that we want.

21 Q Okay.

22 A We wanted a blue LED instead of a red
23 LED. It's that kind of stuff when you're dealing
24 with customers.

25 But primarily the customer codes are

1 have any knowledge about the information that was
2 provided to me.

3 Q (By Ms. Rodewald) And if, in fact, no
4 other OEM reported a high return rate, would that
5 change any of your opinions in this report?

6 A No. This report, as I said before,
7 was not meant to be comprehensive.

8 This report was meant to be exemplary,
9 and so I think you have one good example of Apple
10 having to issue a recall based on a contamination
11 issue of the ST3000DM001.

12 Q And what about the counter example of
13 the other OEMs that apparently did not report a
14 high return rate and did not issue a recall? Did
15 you consider those counter examples?

16 MS. SCARLETT: Objection, form.

17 THE WITNESS: Again, I didn't think
18 that they were necessary because I think that this
19 was meant to be something that was exemplary, and
20 whether someone chose to issue a recall or issue a
21 stop ship or simply not take the product, I didn't
22 think that really mattered.

23 Q (By Ms. Rodewald) Well, here with Apple
24 they were talking about drives that apparently
25 were returned several years after they were

1 originally manufactured, so to your knowledge, was
2 there any other problem like that with any other
3 OEM?

4 MS. SCARLETT: Objection, form.

5 THE WITNESS: So I think the issue
6 there, as I said in Paragraph 188, is that Seagate
7 knew about the contamination as early as 2013, but
8 did not disclose it to Apple for approximately two
9 years, which explains why Apple had these drives
10 for two years before they were returned.

11 I didn't spend a significant amount of
12 effort looking for other examples of recalls
13 because, as I said, this was meant to be an
14 exemplary declaration and not a comprehensive
15 declaration of all the issues and all the problems
16 with all the OEMs.

17 Q (By Ms. Rodewald) Okay. But if it
18 turns out that there weren't other issues with
19 other OEMs, would that change any of your
20 opinions?

21 MS. SCARLETT: Objection, form.

22 THE WITNESS: If given the opportunity
23 to examine all the data, I would certainly
24 reconsider my opinions, but the fact that there is
25 one major OEM that had to recall 135,000 products,

1 MS. SCARLETT: Objection to form.

2 THE WITNESS: I cited this document as
3 an AFR of 0.34.

4 I don't believe I said it was the only
5 document Seagate had ever produced, but, again,
6 I'm presenting exemplary information here, not
7 comprehensive information.

8 Q (By Ms. Rodewald) Right now do you know
9 of any other evidence that Seagate published an
10 AFR of 0.34 percent in April 2011?

11 MS. SCARLETT: Objection to form.

12 THE WITNESS: Off the top of my head,
13 I do not, but I seem to remember advertising
14 different numbers for the AFRs.

15 So the data sheets at some point said
16 0.34 percent, and that was here on Paragraph 53
17 and 54.

18 So I'm sorry, the data sheet remained
19 unchanged, but Seagate continued to advertise the
20 AFR of the ST3000DM001 on its website as 0.34,
21 less than 1 percent, until at least January 2013.

22 Q (By Ms. Rodewald) Do you think it
23 requires your expertise to review the Seagate
24 website and determine what it said about AFR?

25 MS. SCARLETT: Objection to form.

1 THE WITNESS: I'm sorry. I don't
2 understand your question.

3 Q (By Ms. Rodewald) Do you think it
4 requires your expertise to look at Seagate's
5 website and determine what it said about AFR?

6 A I think --

7 MS. SCARLETT: Objection to form.

8 THE WITNESS: I think that any person
9 could look at Seagate's website and see what it
10 says about AFR.

11 Q (By Ms. Rodewald) Okay. Do you think
12 that an ordinary consumer could look at Seagate's
13 website and understand what the AFR meant?

14 A So Seagate changed from MTBF to AFR to
15 make it easier for consumers to understand what it
16 meant, because consumers had a hard time
17 understanding what meantime between failure was on
18 a large population of drives, and they had an
19 easier time of understanding what annual failure
20 rate meant.

21 Q But you think that an ordinary
22 consumer could look at Seagate's website and
23 understand the information presented there?

24 A I don't see any reason why they
25 couldn't.

1 Q And what about with regard to the
2 product manual and the data sheets that you cite
3 in your report?

4 Is this something that requires your
5 expertise to understand?

6 MS. SCARLETT: Objection to form.

7 THE WITNESS: I think that the product
8 manuals and the data sheets are written to be as
9 simplistic as possible.

10 Q (By Ms. Rodewald) Okay.

11 A So I would say no, they don't require
12 a Ph.D. in computer engineering to understand
13 them.

14 MS. RODEWALD: Okay. I believe that's
15 all I have for now.

16 It seems that you have reserved the
17 right to add to your opinions and we definitely
18 reserve the right to continue the deposition of
19 Mr. Hospodor if he revises or adds to his
20 opinions.

21 I would like to mark this transcript
22 as confidential, please.

23 MS. SCARLETT: No questions from the
24 Plaintiffs.

25 THE VIDEOGRAPHER: This marks the end

1
2 I, the undersigned, a Certified Shorthand
3 Reporter for the State of California, do hereby
4 certify that the witness in the foregoing
5 deposition was by me first duly sworn to testify
6 to the truth in the cause herein entitled; that
7 said deposition was taken at the time and place
8 herein stated; that the testimony of said witness
9 was reported by me and thereafter transcribed
10 under my direction into typewriting; that the
11 foregoing is a full, complete and true record of
12 said testimony;

13 I further certify that I am not of
14 counsel or attorney for either or any of the
15 parties in the foregoing matter, nor in any way
16 interested in the outcome of the cause herein
17 named.

18 IN WITNESS WHEREOF, I have hereunto
19 set my hand this 17th day of December, 2017.
20

21 _____
22 MARY HOGAN, CSR NO. 05386
23
24
25